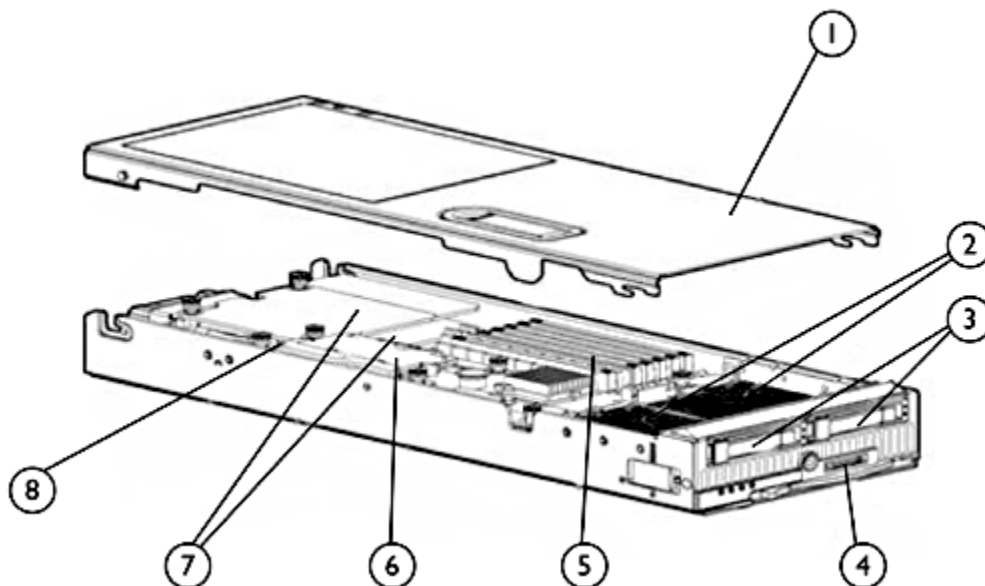## Overview

HP ProLiant BL460c Server Blade

1. Access Panel

2. Up to two Intel® Xeon® 5000 Sequence processors

3. Small form factor (SFF) hot-plug drive bays (standard BTO models)

4. Local I/O connector

5. Eight (8) PC2-5300, Fully Buffered DIMMs (DDR2-667) Memory Slots

6. HP Smart Array E200i Controller with optional battery-backed write cache (standard BTO models)

7. Two Mezzanine slots

8. Internal USB Connector (standard BTO models)

What's New

- Support for Hot Plug SAS Enterprise 300GB 3G SAS 10K SFF DP ENT Hard Drive

At A Glance

This document covers the HP ProLiant BL460c server blade only. For more information on HP BladeSystems c-Class Infrastructure and HP BladeSystem c-Class Interconnect Components, please see the following QuickSpecs:

HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html

HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html

The HP ProLiant BL460c provides greater 2P x86 server blade density without compromise and maximum power-efficiency with flexibility and choice.

QuickSpecs

Overview

HP ProLiant BL460c server blade includes:

- Processor:
  - Up to two Intel® Xeon® 5400 Series processors
  - Up to two Intel® Xeon® 5200 Series processors
  - Supports up to 2 Dual-Core 3.50 GHz, 1333 MHz FSB -1X6 MB Level 2 cache memory, and up to 2 Quad-3.33 GHz 1333MHz-2x6 MB Level 2 cache memory
  - Intel 5000P chipset supporting up to a 1333 MHz Front Side Bus
- Memory:
  - Up to 64 GB of memory, supported by (8) slots of PC2-5300 Fully Buffered DIMMs at 667 MHz
    - NOTE: 64 GB of memory is supported with 80W processors and below. 64 GB of memory is not supported with 120W processors.
    - NOTE: Up to three 16 GB (2 x 8 GB) memory option kits or 48 GB of memory is supported with 120W processors
  - Supporting low-power memory
  - Advanced ECC memory support
  - Supporting memory interleaving (2x1); memory mirroring and online spare capacity.
- Storage Controller:
  - Integrated HP Smart Array E200i RAID controller with 64 MB cache (with optional battery-backed write-cache with an upgrade to 128 MB cache in standard BTO models. Supports RAID 0,1 in standard BTO models
    - NOTE: Drive-less model available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above is not included in the standard Drive-less configure to order model. However, all configure to order models offer optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.
- Internal Drive Support:
  - Up to 2 small form factor (SFF) SAS or SATA hot plug hard disk drives in standard BTO models
    - NOTE: Drive-less model now available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above is not included in the standard Drive-less configure to order model. However, all configure to order mode optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.
- Network Controller:
  - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI
  - One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
  NOTE: The Gigabit Ethernet adapters transmit from the server at 2000 Mbps only, full duplex per port. For more information, see the "Network Controller" item in Standards Features section.
- Mezzanine Support:
  - Two (2) additional I/O expansion slots via mezzanine card.
  - Supports up to two (2) mezzanine cards
    - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (Choice of Emulex or QLogic).
    - Wide variety of 10GbE and 1GbE network adapter options for additional network ports
    - QLogic QMH4062 Gigabit Ethernet iSCSI initiator
    - 4X DDR InfiniBand (IB) Mezzanine (20 Gb/s) options for low latency server interconnectivity (based on Mellanox technology
- Internal USB Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys in standard BTO models
    - NOTE: Drive-less model now available through CTO for customers not utilizing internal disk drives and attaching directly to SAN. Please note that this model does not replace any prior model offerings. The feature listed above

Overview

is not included in the standard Drive-less configure to order model. However, all configure to order mode optional support for small form factor (SFF) hot-plug drive bays, HP Smart Array E200i Controller (with optional battery-backed write cache), and Internal USB Connector. See Factory Integrated Model section for more information.

- Form Factor:
  - ○ HP ProLiant BL460c server blade plugs vertically into the BladeSystem c7000 enclosure and horizontally into the BladeSystem c3000 enclosure.
- Management:
  - ○ HP ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) provides virtual KVM graphical remote console, virtual media, simplified server setup, and core server control functions out of the box.
  - ○ Unlock the full capabilities of the HP ProLiant Onboard Administrator with iLO Advanced for BladeSystem to take advantage of capabilities such as boot and failure sequence replay, on-demand video record and playback, and multi-user console for up to four users. Learn more at: www.hp.com/go/iLO
  - ○ HP Insight Control suite delivers essential management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management. For more information, go to www.hp.com/go/ice
- Operating Systems:
  - ○ Supports Windows, RHEL, SLES, OEL, Solaris, NetWare, VMware, HP Citrix Essentials for XenServer
- Enclosures:
  - ○ HP offers three different c-Class server blade enclosures to meet your individual needs:
    - ▪ The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 16 ProLiant BL460c servers plugged vertically.
    - ▪ The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 8 HP ProLiant BL460c servers plugged horizontally.
    - ▪ The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 8 HP ProLiant BL460c servers plugged vertically.
  - ○ Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c3000 and c7000 enclosures.
- For additional enclosure information, please see: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.
- Warranty:
  - ○ This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty. SAS drives have a 3 year warranty. NOTE: Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Standard Features

Processor	Quad-Core Processor Option Kits
	Intel® Xeon® Processor X5460 (3.160 GHz, 1333 FSB, 120W)*
	Intel® Xeon® Processor X5450 (3.00 GHz, 1333 FSB, 120W)*
	Intel® Xeon® Processor E5450 (3.0 GHz, 1333 FSB, 80W)
	Intel® Xeon® Processor E5440 (2.83 GHz, 1333 FSB, 80W)
	Intel® Xeon® Processor E5430 (2.66 GHz, 1333 FSB, 80W)
	Intel® Xeon® Processor E5420 (2.50 GHz, 1333 FSB, 80W)
	Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50W, LV)
	Intel® Xeon® Processor E5410 (2.33 GHz, 1333 FSB, 80W)*
	Intel® Xeon® Processor L5410 (2.33GHz, 1333FSB, 50W, LV)*
	Intel® Xeon® Processor E5405 (2.0 GHz, 1333 FSB, 80W)
	Intel® Xeon® Processor X5365 (3.00 GHz, 1333 FSB, 120 W)
	Intel® Xeon® Processor X5355 (2.66 GHz, 1333 FSB, 120 W)
	Intel® Xeon® Processor E5345 (2.33 GHz, 1333 FSB, 80 W)
	Intel® Xeon® Processor E5335 (2.00 GHz, 1333 FSB, 80 W)
	Intel® Xeon® Processor L5335 (2.00 GHz, 1333 FSB, 50 W, LV)
	Intel® Xeon® Processor L5320 (1.86 GHz, 1066 FSB, 50 W, LV)
	Intel® Xeon® Processor L5320 (1.86 GHz, 1066 FSB, 50 W, LV)
	Intel® Xeon® Processor E5310 (1.60 GHz, 1066 FSB, 80 W)
	Dual-Core Processor Option Kits
	Intel® Xeon® processor X5270 (3.50 GHz, 1333 FSB, 80W)*
	Intel® Xeon® processor X5260 (3.33 GHz, 1333 FSB, 80W)
	Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV)
	Intel® Xeon® processor E5205 (1.86GHz, 1333 FSB, 65W)

*Offered through Configure-To-Order only. See Factory Integrated Models section for more details.
NOTE: Intel 5400 and 5200 Series processors are 64-bit and support Intel VT. Intel. 5200 Series processors are dual-core; Intel 5400 series processors are quad-core.
NOTE: For the Intel 5200 and 5400 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

Upgradeability	Upgradeable to 2 processors
	Future upgradeable to Xeon® Series 5400/5300 Quad-Core processors (Please contact your regional sales support to determine quad core upgradeability. Some of the earlier shipping models may not support this upgrade). 5100 Dual-Core models are not upgradeable to the 5200 Dual-Core processors.

Cache Memory	2 x 6 MB shared L2 cache (5400 Series)
	1 x 6 MB L2 cache (5200 Series)

Chipset	Intel® 5000P Chipset

Standard Features

Memory	Type	PC2-5300 Fully Buffered DIMMs at 667 MHz
	Standard	1 GB (2 x 512 MB) 2 GB (2 x 1 GB)
	Maximum	64 GB (8 x 8 GB) NOTE: Memory must be installed in pairs. NOTE: 64GB of memory is supported with 80W processors and below. 64GB of memory is NOT supported with 120W processors. NOTE: Up to three 16GB (2 x 8 GB) of memory is supported with 120W processors

Network Controller	Two (2) embedded NC373i Multifunction Gigabit Server Adapters with iSCSI boot, TCP/IP offload engine, and optional accelerated iSCSI
	One (1) additional 10/100 NIC dedicated to iLO 2 Management NOTE: The Gigabit Ethernet adapters transmit from the server at 2000 Mbps, full duplex per port only. However, within a Linux environment, the speed can be reduced or "throttled" using a feature available within the Linux operating system; see the white paper at: http://h71028.www7.hp.com/ERC/downloads/4AA1-5513ENW.pdf for more information.

Multifunction Networking The embedded multifunction NC373i adapters combine standard Gigabit Ethernet networking, TCP/IP offload engine (TOE), iSCSI boot and optional accelerated iSCSI into a single adapter.

- TOE moves the processing of data in the TCP protocol stack from the server CPU to the network card, freeing CPU cycles for other activities. With TOE, network communications are improved, and server efficiency is increased. The NC373i offers TOE for Microsoft® Windows 2000 and 2003 environments.
- The iSCSI network boot (iSCSI boot) allows the BL460c to boot from a remote operating system (OS) image located on a storage area network (SAN). The BL460c uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL460c is configured to connect to and boot from the iSCSI target disk on the network and download the OS image from the iSCSI target disk. The iSCSI boot option ROM is supplied by HP at no cost. The additional cost and mezzanine slot usage of an add-in iSCSI HBA card is not required. Additionally, the HP iSCSI boot solution includes scripts to significantly simplify the installation process.

I/O Expansion Slots Two I/O expansion mezzanine slots (one x8 and one x4)

Integrated Manageability HP ProLiant Onboard Administrator (includes but not limited to functionality in Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

Storage Controller	HP Smart Array E200i Controller	64 MB memory module supports RAID 0,1 Available upgrades: 128 MB with Battery-backed write cache
	NOTE: For customers who choose to configure a driveless model via CTO, a storage controller is not required. See Factory Integrated Models section for more information.	

Standard Features

Maximum Internal Storage	Hot Plug SAS	600GB SAS	2 x 300GB Serial SCSI
	Hot Plug SATA	500GB SATA	2 x 250GB Serial ATA

NOTE: For customers who choose to configure a driveless model via CTO, internal storage is not required. See Factory Integrated Models section for more information.

Graphics	Integrated ATI RN-50 1600x1280x64K 16M color (32 MB DDR1 memory)

Graphics Resolution Supported	Resolution Color Depths	1600 x 1280, 64K, 256, 16
		1280 x 1024, 16.7M, 64k, 256, 16
		1024 x 768, 16.7M, 64k, 256,16
		800 x 600, 16,7M, 64k, 256, 16
		640 x 480, 16,7M, 64k, 256, 16

Fibre Channel Support Two optional Fibre Channel HBAs are supported by the HP ProLiant BL460c. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be ordered separately.

Two option kits

Emulex LPe1105-HP 4Gb FC HBA for HP c-Class BladeSystem (403621-B21)

- Based on the same field-proven ASIC, firmware, and driver technology as Emulex's renowned LPe1150 HBA, the Emulex LPe1105-HP is fully driver compatible with all Emulex HBAs

QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other 4Gb and 2Gb HBAs powered by QLogic

Emulex and QLogic Fibre Channel HBAs feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds
- Dual-ports for redundant path connections
- Up to two FC HBAs per server blade providing redundant FC HBA support
- Optimized for HP StorageWorks and supported by third party SAN vendors
- Support for Microsoft® Windows® and Linux operating systems environments

Compatible SAN HP ProLiant BL460c server blades are optimized for HP StorageWorks MSA, EVA and XP

HP ProLiant 460c server blades are compatible with select 3rd party SANs (please see blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-class/storage.html

Insight Control suite (ICE) The HP Insight Control suite delivers essential infrastructure management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management

HP Control Insight suite installs and licenses the following components by default using a wizard-based integrated installer:

Standard Features

- HP Systems Insight Manager
- HP iLO Advanced for BladeSystem or iLO Advanced software
  NOTE: iLO Advanced license will be enabled when ICE is purchased as standalone software
- HP Insight Power Manager software
- HP Insight Rapid Deployment software
- HP Insight Performance Management module
- HP Insight Vulnerability and Patch Management module
- HP Insight Virtual Machine Manager software for ProLiant

NOTE: The Insight Control Environment for BladeSystem suite is no longer being sold as standalone software. You can continue to purchase Insight Control suite for BladeSystem with the c-Class enclosure as before. For standalone software, you can purchase the Insight Control suite starting January 26, 2009. The standalone Insight Control suite license will license HP ProLiant ML, DL and BL servers.

- ICE standalone license covers iLO Advanced Pack, SIM, RDP, IPM, PMP, VPM, VMM
- ICE license purchased with a c-Class enclosure covers iLO Advanced for BladeSystem, SIM, RDP, IPM, PMP, VPM and VMM

Additional Insight Software and management tools included on the Insight Software media kit can be installed manually:

- HP Server Migration Pack software for ProLiant
  NOTE: HP Server Migration Pack software for ProLiant is licensed separately from the Insight Control Environment Suite. HP Insight Remote support standard.
- HP Insight Remote Support Advanced (previously Service Essentials Remote Support Pack)

NOTE: HP Insight Server Migration software for ProLiant can be installed from the SMP-Universal CD included in the Insight Control Management media kit.
NOTE: Insight Control suite can be installed from the Insight Control Management DVDs, which can be delivered with HP BladeSystem c-Class enclosures with a choice of licensing options. Licensing options include a free 30 day evaluation license for 8 servers (default option for every enclosure order), a full purchased license for 8 blade servers or a full purchased license for 16 blade servers). For additional information on HP c-Class Infrastructure please visit HP BladeSystem c-Class Enclosures QuickSpecs:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html
NOTE: For additional product and licensing information about Insight Control Environment for BladeSystem, HP Systems Insight Manager and Essentials software refer to:
http://www.hp.com/servers/proliantessentials.

HP Insight Control Environment for Linux (ICE-Linux) provides comprehensive discovery, imaging & deployment, monitoring, and management for Linux-based ProLiant server platforms. Built on the industry-leading HP Systems Insight Manager framework, this solution integrates open source technology with experience leveraged from HP's Linux products in HP ICLE and HP XC Clusters, while providing paths to the future with developing management technologies.

NOTE: As of February 1, 2009, HP iLO Power Management Pack for BladeSystem is being discontinued. Customer can either purchase HP Insight Control Environment suite which contains all the components of IPMP or the standalone components which include iLO Advanced, Insight Power Manager and System Insight Manager.

Standard Features

HP Insight Control management suites and most HP Insight Software titles include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. From more information about this service, please visit: http://www.hp.com/services/insight.

NOTE: For additional product and licensing information about Insight Control suite, HP Systems Insight Manager and other Insight Software titles refer to: http://www.hp.com/go/insightcontrol.

HP ProLiant Onboard Administrator	HP ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. It works hand-in-hand with the HP BladeSystem Onboard Administrator, HP Systems Insight Manager, Insight Control, and Insight Dynamics helping customers unlock the value of the ProLiant platform and deliver the highest possible quality of IT service to the business.

Capabilities of the HP ProLiant Onboard Administrator embedded in ProLiant BL servers include, but are not limited to the following:

- Rom-based Setup Utility (RBSU) and Option Rom Configuration for Arrays (ORCA)
- IML and iLO event logging
- Automatic Server Recover (ASR)
- OS independent hardware health status
- Present server power consumption
- Virtual Unit ID control
- Virtual KVM based remote console
- Virtual media (single server, browser based access only)
- Remote serial console
- Virtual power button control
- Dynamic Sector Repairing (with Smart Array controller)
- Drive Parameter Tracking (with Smart Array controller)
- Integrated remote console (ActiveX Control client)
- Single Sign-on from BladeSystem Onboard Administrator

Unlock the full capabilities of HP ProLiant Onboard Administrator with iLO Advanced for BladeSystem.

Server Management Stand Alone Software Products	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	HP Insight Rapid Deployment software	HP Insight Rapid Deployment software extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant blade servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles. For more information, visit: http://www.hp.com/go/rdp.
	HP Insight Performance Manager module	HP Insight Performance Manager module (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
	HP Insight Dynamics - VSE	The HP Insight Dynamics - VSE suite for ProLiant is advanced infrastructure

Standard Features

suite for ProLiant	management software that allows you to analyze and optimize your adaptive infrastructure to manage physical and virtual resources in the same way. HP Insight Dynamics - VSE gives you a powerful toolkit to accelerate complex technology projects and simplify daily operations. It enables you to plan capacity and power continuously, balance across physical and virtual resources, ensure cost-effective high availability, and provision infrastructure consistently.

NOTE: For more information, please see: http://www.hp.com/go/insightdynamics |
| HP Insight Server Migration software for ProLiant | Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. HP Insight Server Migration software for ProLiant allows all of the following migrations:

- Physical to ProLiant
- Physical to virtual
- Virtual to virtual
- Virtual to ProLiant

NOTE: For more information, visit: http://www.hp.com/go/migrate. |
| HP Insight Virtual Machine Manager software for ProLiant | Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. HP Insight Virtual Machine Manager software for ProLiant provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association. The HP Insight Server Migration software for ProLiant plug-in automates the manual task of migrating servers between physical or virtual platforms. . For additional information, please see: www.hp.com/go/vm-manage. |
| HP Insight Vulnerability and Patch Manager module | HP Insight Vulnerability and Patch Manager module (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats. |
| iLO Advanced for BladeSystem | Unlocks the full capabilities of the ProLiant Onboard Administrator with enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, Dynamic Power Capping and enterprise security (directory services and two-factor authentication). For additional information, please see: http://www.hp.com/go/iLO

NOTE: Flexible and volume quantity license kits are available f HP Insight Software. Refer to: http://www.hp.com/go/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.
NOTE: Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at: http://www.hp.com/services/insight |

Standard Features

Core Infrastructure Management	HP ProLiant Essentials Foundation Pack	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecyle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation.
The foundation pack includes:

- HP SmartStart
- HP Management
- HP ProLiant Firmware Maintenance

SmartStart version supported (minimum): SmartStart 8.0
http://www.hp.com/servers/smartstart

Insight Management Agents

The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers.

Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the Insight Rapid Deployment software.

For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.

Subscriber's Choice

Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice
and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.

ProLiant Support Packs and ROMPaq software

The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the Insight Rapid Deployment Software (RDP), SmartStart or downloaded from software and drivers download pages website at: http://www.hp.com/go/support.

Standard Features

HP Serviceguard for Linux (SGLX)

HP Serviceguard for Linux is a high availability clustering solution designed to protect applications and services from a wide variety of software and hardware failures, monitoring the health of each server (node) and quickly responding to failures such as those that affect system processes, system memory, LAN media and adapters, and application processes.

The following is a quick summary of HP Serviceguard for Linux features and support. For the most recent list of Linux distributions & kernels, servers and storage supported with Serviceguard for Linux, see the Serviceguard for Linux Datasheet, available at: http://www.hp.com/go/sglx/info.

- Supported Linux Distributions:
  - Red Hat EL 4
  - Red Hat EL 5
  - SUSE SLES10
- Supported Server Platforms
  - HP Integrity BladeSystem to Superdome
  - HP ProLiant BladeSystem p-Class & c-Class
  - HP ProLiant DL
  - HP ProLiant ML
  - IBM System x
  - Dell PowerEdge
  - Sun x64
  - Fujitsu Siemens PRIMERGY
- Supported Virtual Machines
  - SG/LX in HP Integrity Virtual Machines guests
  - SG/LX in VMware ESX guests
  - SG/LX in Red Hat and SUSE Xen hosts (DOM0)
- Application Integration Toolkits
  - HP Serivceguard for Linux Oracle Database Toolkit
  - HP Serviceguard Extension for SAP on Linux (SGeSAP/LX)
  - Free Application Integration Toolkits:
    - Apache
    - MySQL
    - NFS
    - PostgreSQL
    - Samba
    - Tomcat
    - Sendmail
- Disaster Tolerant Solutions
  - HP Serviceguard for Linux Extended Distance Cluster (XDC) extends cluster distances up to 100 km, utilizes software RAID mirroring for data replication and is storage array independent
  - HP StorageWorks XP/EVA Cluster Extension Software for Linux (CLX) works seamlessly with HP Serviceguard for Linux, HP StorageWorks Continuous Access, and HP Disk Arrays to automate failover and failback between sites
- Software updates are distributed by HP Services to customers with support contracts

NOTE: The above is not a complete list of all HP Serviceguard for Linux product numbers For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Configuration & Ordering Guide available at: http://www.hp.com/go/sglx/info.

QuickSpecs

Standard Features

Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Enterprise Linux (OEL) Solaris 10 for x86/x64 based Systems NetWare VMware HP Citrix Essentials for XenServer NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos.

Availability	• Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection • Two (2) embedded Gigabit Ethernet adapters for redundant LAN connections Two (2) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array E200i) controller on every BTO model server blade (Battery-backed write cache is optional.)* • Redundant ROM on each server blade • Advanced ECC Memory – can correct a multi-bit error (up to 4 bits) that occurs within one memory chip • Memory Mirroring • Memory Online Spare Capacity • Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing) * For customers who choose to configure a driveless model via CTO, these features are not required. See Factory Integrated Models section for more information.

Industry Standard Compliance	ACPI 2.0 Compliant PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB 2.0 Support

Security	• One (1) internal USB 2.0 connector for security key devices and USB drive keys on every BTO model server blade* Power-on password • Administrator's password • Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption • Integrated Lights-Out 2 can be disabled via a Global Setting * For customers who choose to configure a driveless model via CTO, internal USB connectors are not available unless 447711-B21 is selected. See Factory Integrated Models section for more information.

Standard Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.
NOTE: This feature is not supported in the NEW Drive-less model which is available through CTO for those who do not utilize internal hard disk drives and attach to SAN.

Service and Support

HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs.

The HP Care Pack service for HP ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BladeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service – Simplify ProLiant solution implementation, maintenance and management.

- Support Service – 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- Deployment Service – Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- Support Service – HP Proactive BladeSystem Service, 1-Year
- Deployment Service – Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://www.hp.com/go/proliant/carepack

QuickSpecs

Models

Quad-Core Models

HP ProLiant BL460c E5450 2G (1P) 459483-xx1	Processor(s) One of the following depending on model	(1) Intel® Xeon® Processor E5450 (3.00 GHz, 1333 FSB, 80W) (1) Intel® Xeon® Processor E5440 (2.83 GHz, 1333 FSB, 80W) (1) Intel® Xeon® Processor E5430 (2.66 GHz, 1333 FSB, 80W)
HP ProLiant BL460c E5440 2G (1P) 459484-xx1		(1) Intel® Xeon® Processor E5420 (2.50 GHz, 1333 FSB, 80W) (1) Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50W) (1) Intel® Xeon® Processor L5410 (2.33 GHz, 1333 FSB, 50W) (1) Intel® Xeon® Processor E5405 (2.00 GHz, 1333 FSB, 80W)
HP ProLiant BL460c E5430 2G (1P) 459485-xx1	Cache Memory	2 x 6 MB Level 2 cache (5400 Series) 2 x 4 MB Level 2 cache (5300 Series)
	Memory One of the following depending on model	2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667 1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667
HP ProLiant BL460c E5420 2G (1P) 459486-B21	Network Adapter	Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management
HP ProLiant BL460c L5420 2G (1P) 462872-B21	Storage Controller	HP Smart Array E200i Controller with 64MB (optional battery-backed write cache)
	Hard Drives	No drives included; (2) SFF SAS/SATA drive bays
HP ProLiant BL460c L5410 2G (1P) 462873-B21	Internal Storage	SAS: 600GB SATA: 500GB
	Optical Drive	None
HP ProLiant BL460c E5405 1G (1P) 459487-xx1	Form Factor	Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure

Dual-Core Models

HP ProLiant BL460c X5260 2G, (1P) 461603-B21	Processor(s) One of the following depending on model	(1) Intel® Xeon® processor X5260 (3.3 GHz, 1333 FSB, 80 W) (1) Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV) (1) Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W)
	Cache Memory	1 x 6 MB Level 2 cache memory (5200 Series)
HP ProLiant BL460c L5240 2G, (1P) 461604-B21	Memory One of the following depending on model	2 GB (2 x 1 GB) PC2-5300, FBD DDR2-667 1 GB (2 x 512 MB) PC2-5300, FBD DDR2-667
HP ProLiant BL460c E5205 1G, (1P) 461605-B21	Network Adapter	Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 network adapter dedicated to iLO 2 Management
	Storage Controller	HP Smart Array E200i Controller with 64MB (optional 128 MB battery-backed write cache)
	Hard Drives	No drives included; (2) SFF SAS/SATA drive bays
	Internal Storage	SAS: 600GB SATA: 500GB
	Optical Drive	None
	Form Factor	Up to 8 half-height blades supported in HP BladeSystem c3000 Enclosure Up to 16 half-height blades supported in HP BladeSystem c7000 Enclosure

Models

Country Code Key   XX=B2   Worldwide

                                  XX=20   Brazil

QuickSpecs

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order server blades must start with a CTO Blade.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Server Blade Configuration (Select a configurable Blade)

Models   HP ProLiant BL460c Driveless CTO Blade   447707-B21

Configurable Model ships with:

Two (2) embedded NC373i Multifunction Gigabit Server Adapters plus one (1) additional 10/100 NIC dedicated to iLO 2 Management

Integrated Lights-Out 2 Standard Blade Edition

Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

Processors   For single processor configuration choose:

Quad-Core Processor Option Kits

Intel® Xeon® Processor X5470 (3.33 GHz, 1333 FSB, 120W)Option Kit, FIO   492308-L21
NOTE: If 2 processors are desired, select one 492308-L21 and one 492308-B21.

Intel® Xeon® processor X5460 (3.16 GHz, 1333 FSB, 120 W) Option Kit, FIO Base   459973-L21
NOTE: If 2 processors are desired, select one 459973-L21 and one 459973-B21.

Intel® Xeon® processor X5450 (3.00 GHz, 1333 FSB, 120 W) Option Kit, FIO Base   463056-L21
NOTE: If 2 processors are desired, select one 463056-L21 and one 463056-B21.

Intel® Xeon® processor E5450 (3.00 GHz, 1333 FSB, 80 W) Option Kit, FIO Base   459489-L21
NOTE: If 2 processors are desired, select one 459489-L21 and one 459489-B21.

Intel® Xeon® processor E5440 (2.83 GHz, 1333 FSB, 80 W) Option Kit, FIO Base   459490-L21
NOTE: If 2 processors are desired, select one 459490-L21 and one 459490-B21.

Intel® Xeon® processor E5430 (2.66 GHz, 1333 FSB, 80 W) Option Kit, FIO Base   459491-L21
NOTE: If 2 processors are desired, select one 459491-L21 and one 459491-B21.

Intel® Xeon® Processor E5420 (2.50 GHz, 1333 FSB, 80 W) Option Kit, FIO Base   459492-L21
NOTE: If 2 processors are desired, select one 459492-L21 and one 459492-B21.

Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50 W, LV) Option Kit, FIO Base   462876-L21
NOTE: If 2 processors are desired, select one 462876-L21 and one 462876-B21.

Intel® Xeon® processor E5410 (2.33 GHz, 1333 FSB) Option Kit, FIO Base   459493-L21
NOTE: If 2 processors are desired, select one 459493-L21 and one 459493-B21.

Intel® Xeon® Processor L5410 (2.33 GHz, 1333 FSB, 50 W LV), Option Kit, FIO Base   462877-L21
NOTE: If 2 processors are desired, select one 462877-L21 and one 462877-B21.

Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80 W) Option Kit, FIO Base   459494-L21
NOTE: If 2 processors are desired, select one 459494-L21 and one 459494-B21.

Dual-Core Processor Option Kits

Configuration Information - Factory Integrated Models

	Intel® Xeon® processor X5270 (3.50 GHz, 1333 FSB, 80W)	492309-L21
	NOTE: If 2 processors are desired, select one 492309-L21 and one 492309-B21.	
	Intel® Xeon® processor X5260 (3.33 GHz, 1333 FSB, 80 W) Option Kit, FIO Base	461623-L21
	NOTE: If 2 processors are desired, select one 461623-L21 and one 461623-B21.	
	Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV) Option Kit, FIO Base	461624-L21
	NOTE: If 2 processors are desired, select one 461624-L21 and one 461624-B21	
	Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W) Option Kit, FIO Base	461625-L21
	NOTE: If 2 processors are desired, select one 461625-L21and one 461625-B21.	
Memory	1 GB FBD PC2-5300 (2 x 512 MB) Kit	397409-B21
	2 GB FBD PC2-5300 (2 x 1 GB LP) Kit	461826-B21
	2 GB FBD PC2-5300 (2 x 1 GB) Kit	397411-B21
	4 GB FBD PC2-5300 (2 x 2 GB LP) Kit	461828-B21
	4 GB FBD PC2-5300 (2 x 2 GB) Kit	397413-B21
	8 GB FBD PC2-5300 (2 x 4 GB) Kit	397415-B21
	8 GB FBD PC2-5300 (2 x 4 GB LP) Kit	466440-B21
	16 GB FBD PC2-5300 (2 x 8 GB) Kit	413015-B21
	64 GB FBD PC2-5300 (8 x 8 GB) Kit	495604-B21

NOTE: Memory Option Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:
http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

NOTE: Must be installed in pairs
NOTE: 64GB of memory is supported with 80W processors and below. 64GB of memory is Not supported with 120W processors.
NOTE: Up to three 16 GB (2 x 8 GB) memory option kits or 48 GB of memory is supported with 120W processors.

Step 3: Choose Additional Factory Integratable Options (one of the following from eac unless otherwise noted):

Hard Drive Backplane	HP ProLiant BL460c Hard Disk Drive Backplane, FIO	447711-B21
	NOTE: Includes USB connector.	
	NOTE: The Hard Drive Backplane is required for all blades that support hard disk drives or require the internal USB 2.0 connector for security key devices, licensing or VMware ESX Server 3i.	
Controller Cache	64 MB Cache - FIO Only	405102-B21
	NOTE: Integrated HP Smart Array E200i RAID controller supporting RAID 0/1 Controller cache module selection is required for all blades that support hard disk drives. Select either the standard 64 MB module above or the optional 128 MB module below.	
	NOTE: This option is not required when configuring a Drive-less Model.	
	128 MB Battery-Backed Cache Enabler	351580-B21
	NOTE: Supports the HP Smart Array E200i Controller.	
	NOTE: This option is not required when configuring a Drive-less Model.	

Configuration Information - Factory Integrated Models

Step 4: Choose Additional Options for Factory Integration

Core Options

Ethernet Mezzanine Options	**Gigabit Ethernet Mezzanines**	
	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
	NOTE: If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on 2 of the 4 ports	
	HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem	406771-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	NOTE: If the NC364m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports	
	HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	HP NC382m Dual Port 1GbE Multifunction BL-c Adapter	453246-B21
	NOTE: The Gigabit Ethernet adapters above transmit from the server at 2000 Mbps, full duplex per port only. For more information, see the "Network Controller" segment in the Standards Features section.	
	HP NC532m Dual Port 10GbE BL-c Adapter	467799-B21
	NOTE: The NC532m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure) NOTE: The NC532m requires a minimum of 2 GB of server memory NOTE: The NC532m will downspeed to 1Gb if paired with a 1Gb interconnect	
	10 Gigabit Ethernet Mezzanines	
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter NOTE: The NC512m is supported in type II x8 PCI Express mezzanine slots; maximum two adapters per server. For more information, see the Mezzanine Slot Compatibility matrix within the HP NC512m Dual Port 10GbE Multifunction BL-c Adapter QuickSpecs: http://h18004.www1.hp.com/products/servers/networking/nc512m/index.html. NOTE: A minimum of 2 GB of server memory is required per NC512m and supports a maximum of 32 GB for Windows and 64 GB for Linux. NOTE: The NC512m adapter transmits from the server only at 20 Gbps, full duplex per port.	440910-B21
	QLogic QMH4062 1Gb E iSCSI Adapter for HP BladeSystem c-Class	488074-B21
Fiber Channel Mezzanine Options	Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21

Core Options

Processors	Quad-Core Process Option Kits	
	Intel® Xeon® Processor X5470 (3.33 GHz, 1333 FSB, 120W)	492308-B21
	Intel® Xeon® Processor X5460 (3.16 GHz, 1333 FSB, 120 W)	459973-B21
	Intel® Xeon® processor X5450 (3.00GHz 1333 FSB, 120 W)	463056-B21
	Intel® Xeon® processor E5450 (3.00GHz 1333 FSB, 80 W)	459489-B21
	Intel® Xeon® processor E5440 (2.83 GHz, 1333 FSB, 80 W)	459490-B21
	Intel® Xeon® processor E5430 (2.66 GHz, 1333 FSB, 80 W)	459491-B21
	Intel® Xeon® processor E5420 (2.50 GHz, 1333 FSB, 80 W)	459492-B21
	Intel® Xeon® Processor L5420 (2.50 GHz, 1333 FSB, 50 W, LV)	462876-B21
	Intel® Xeon® processor E5410 (2.33 GHz, 1333 FSB, 80 W)	459493-B21
	Intel® Xeon® Processor L5410 (2.33 GHz, 1333 FSB, 50 W)	462877-B21
	Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80 W)	459494-B21
	Intel® Xeon® Processor X5365 (3.00 GHz, 1333 FSB, 120 W)	453190-B21
	Intel® Xeon® Processor X5355 (2.66 GHz, 1333 FSB, 120 W)	435565-B21
	Intel® Xeon® Processor E5345 (2.33 GHz, 1333 FSB, 80 W)	435564-B21
	Intel® Xeon® Processor E5335 (2.00 GHz, 1333 FSB, 80 W)	443753-B21
	Intel® Xeon® Processor L5335 (2.00 GHz, 1333 FSB, 50 W, LV)	453609-B21
	Intel® Xeon® Processor L5320 (1.86 GHz, 1066 FSB, 50 W, LV)	443752-B21
	Intel® Xeon® Processor L5320 (1.86 GHz, 1066 FSB, 50 W, LV)	435563-B21
	Intel® Xeon® Processor E5310 (1.60 GHz, 1066 FSB, 80 W)	435562-B21
	Dual-Core Process Option Kits	
	Intel® Xeon® processor X5270 (3.50 GHz, 1333 FSB, 80W)	492309-B21
	Intel® Xeon® processor X5260 (3.33 GHz, 1333 FSB, 80 W) Option Kit	461623-B21
	Intel® Xeon® processor L5240 (3.00 GHz, 1333 FSB, 40 W, LV) Option Kit	461624-B21
	Intel® Xeon® processor E5205 (1.86 GHz, 1333 FSB, 65 W) Option Kit	461625-B21

Memory	1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Kit	461826-B21
	2 GB FBD PC2-5300 2 x 1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Kit	461828-B21
	4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Kit	466440-B21
	16 GB FBD PC2-5300 2 x 8 GB Kit	413015-B21
	64 GB FBD PC2-5300 8 x 8 GB Kit	495604-B21

NOTE: Memory Option Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:
http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

NOTE: Must be installed in pairs.
NOTE: 64GB of memory is supported with 80W processors and below. 64GB of memory Not supported with 120W processors.
NOTE: Up to three 16 GB (2 x 8 GB) memory option kits or 48 GB of memory is supported with 120W processors.

QuickSpecs

HP ProLiant BL460c Server Blade

Core Options

Hard Drives	SAS Hot Plug SFF Enterprise (ENT) Drives	
	HP 300GB 3G SAS 10K SFF DP HDD	492620-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
	HP 72GB 3G SAS 15K SFF DP HDD	418371-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36GB 3G SAS 15K SFF DP HDD	418369-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21

NOTE: SAS drives have a 3 year warranty.
NOTE: Please see QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)
NOTE: The hard drive options are not required when configuring a Drive-less Model.

	SATA SFF Hot Plug Entry (ETY) Drives	
	HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
	HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21

NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

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Additional Options

HP Insight Control suite (ICE)	NOTE: Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information: www.hp.com/go/ice.	
	Insight Control suite	
	HP Insight Control suite, No Media, 1-Server License including 1 year of 24x7 Technical Support and Updates	452148-B22
	NOTE: Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	
	HP Insight Software Media Kit	436222-B21
	NOTE: Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates.	
	NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Control suite for Linux	
	HP Insight Control suite for Linux Edition, No Media, 1-Server License including 1 year of 24x7 Technical Support and Updates	464423-B21
	NOTE: This part number can be used to purchase one (1) license with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. One certificate is shipped for each license.	
	HP Insight Control Linux Edition Media Only Kit	464422-B21
	NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control Environment for Linux, HP Systems Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager software for ProLiant, and an integrated installer. Servers must be acquired separately. This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).	
	NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
Server Management Stand Alone Software Products	NOTE: Electronic licensing options are available for Insight Control suites and select Insight Software products. Please see the appropriate Insight Control and Software QuickSpecs for additional information.	
	Deploy	
	HP Insight Rapid Deployment software	
	HP Insight Rapid Deployment software 1-Server License including 1 year of 24x7 Technical Support and Updates	452151-B21
	NOTE: This license allows 1 server to be deployed and managed via RDP. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and	

Additional Options

Update Service.
NOTE: This license formerly known as ProLiant Essentials Rapid Deployment Pack.

NOTE: For additional License Kits- please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.html

HP Insight Server Migration software for ProLiant

HP Insight Server Migration software for ProLiant, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support NOTE: This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.	460750-B21
HP Insight Server Migration software for ProLiant,, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support NOTE: This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.	460753-B21
HP Insight Server Migration software for ProLiant, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support NOTE: This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.	460756-B21

NOTE: For additional License Kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12855_div/12855_div.html

Monitor

HP Insight Dynamics-VSE suite for ProLiant

HP Insight Dynamics-VSE without Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates NOTE: This license supports HP ProLiant ML/DL and c-Class Blade servers. Customer will receive via email a receipt and link to a license entitlement certificate.	483531-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/13050_div/13050_div.html

Control

HP iLO Advanced Pack for BladeSystem

HP Integrated Lights-Out Advanced for BladeSystem, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html	512488-B21

Featuring: Sophisticated remote control and security features for HP BladeSystem servers and ProLiant ML/DL servers.
NOTE: For additional License Kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html

Optimize

HP Insight Power Manager software (IPM)

HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7	452677-B21

Additional Options

Technical Support and Updates
NOTE: Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

NOTE: For additional License Kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12623_div/12623_div.html

HP Insight Virtual Machine Management software for ProLiant

HP Insight Virtual Machine Manager software for ProLiant,, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates	452153-B21

NOTE: Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

NOTE: For additional License Kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12328_div/12328_div.html

NOTE: Flexible and volume quantity license kits are available for Insight Software titles. Refer to: http://www.hp.com/servers/insightcontrol or the various Insight Software product QuickSpecs for more information.

Storage Controller	HP Smart Array P700M/512 Controller	508226-B21
	HP Smart Array P700M/256 Controller	507925-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html (Worldwide)

Controller Cache	128MB Battery-Backed Cache Enabler	351580-B21

NOTE: Supports the HP Smart Array E200i Controller.
NOTE: This option is not required when configuring a Drive-less Model.

I/O Accelerator Mezzanine Options	HP StorageWorks 80GB IO Accelerator for BladeSystem c-Class	AJ876A
	HP StorageWorks 160GB IO Accelerator for BladeSystem c-Class	AJ877A
	HP StorageWorks 320GB IO Accelerator for BladeSystem c-Class	AJ878A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13175_div/13175_div.html

HP InfiniBand Mezzanine Options	HP 4X DDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	410533-B21

Additional Options

HP c-Class Tape Blades	HP StorageWorks SB920c Tape Blade	AJ401A
	NOTE: LTO-3 Ultrium technology	
	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	NOTE: LTO-2 Ultrium technology	
	NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem (431643-B21) is required when installing a tape blade adjacent to a full-height server blade.	
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	
	http://h18000.www1.hp.com/products/quickspecs/12729_div/12729_div.html	

HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade	411243-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	
	http://h18000.www1.hp.com/products/quickspecs/12587_div/12587_div.html (Worldwide)	

HP PCI Expansion Blade	HP PCI Expansion Blade	448018-B21
	NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation.	
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	
	http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html	

High Availability Cluster Options	HP Serviceguard for Linux	
	HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers - Physical Media Kit	519353-B21
	NOTE: This kit contains media only.	
	HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers Single-Server License	519354-B21
	Licensed per Server	
	NOTE: This license allows Serviceguard for Linux to be installed on 1 server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	
	HP Serviceguard for Linux - Flexible-Quantity License	519355-B21
	(for HP ProLiant and other third-party x86 servers)	
	Licensed per Server	
	NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service	
	HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers	463833-B21
	Licensed per cluster	
	Includes media and One Year 24x7 Software Support & Updates	

Additional Options

	HP Serviceguard Extension for SAP on Linux for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463834-B21
	HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463835-B21

NOTE: The above is not a complete list of all HP Serviceguard for Linux product numbers For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Configuration & Ordering Guide available at: http://www.hp.com/go/sglx/info.

USB Options		
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	Multibay II 9.5mm DVD Drive	PA849A
	2004 Standard Keyboard USB	DT528A#xxx
	1.44MB External USB Floppy Drive	DC141B

Service and Support Offerings (HP Care Pack Services)		
	NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UK065E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK066E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UK067E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	UE473E

QuickSpecs

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Fully Buffered DIMMs at 667 MHz.
2. Both DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential alphabetic order, starting with bank A.
4. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
5. Multiple advanced memory protection (AMP) modes are supported, based on FBDIMM population and RBSU selection. The server blade defaults to Advanced ECC

HP ProLiant BL460c Server Blade (1P Model)

Standard Memory

1024 MB (2 x 512 MB) or 2048 MB (2 x 1024 MB) (depending on model)of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 50176 MB or 51200 MB (depending on model) of PC2-5300, FBD DDR2-667 ECC DIMMs. Memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 65536 MB of PC2-5300, FBD DDR2 FBD-667 ECC DIMMs. Memory is available with removal of standard and the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Memory		Slot							
		1A	2C	3A	4C	5B	6D	7B	8D
Standard	1024 MB	512 MB	Empty	512 MB	Empty	Empty	Empty	Empty	Empty
Standard	2048 MB	1024 MB	Empty	1024 MB	Empty	Empty	Empty	Empty	Empty
Optional	50176 MB	512 MB	8192 MB	512 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB
Optional	51200 MB	1024 MB	8192 MB	1024 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB
Maximum	65536 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB	8192 MB

Following are memory options available from HP:

1 GB FBD PC2-5300 (2 x 512 MB) Kit	397409-B21
2 GB FBD PC2-5300 (2 x 1 GB LP) Kit	461826-B21
2 GB FBD PC2-5300 (2 x 1 GB) Kit	397411-B21
4 GB FBD PC2-5300 (2 x 2 GB LP) Kit	461828-B21
4 GB FBD PC2-5300 (2 x 2 GB) Kit	397413-B21
8 GB FBD PC2-5300 (2 x 4 GB) Kit	397415-B21
8 GB FBD PC2-5300 (2 x 4 GB LP) Kit	466440-B21
16 GB FBD PC2-5300 (2 x 8 GB) Kit	413015-B21
64 GB FBD PC2-5300 (8 x 8 GB) Kit	495604-B21

NOTE: 64GB of memory is supported with 80W processors and below. 64GB of memory is Not supported with 120W processors.
NOTE: Up to three 16 GB (2 x 8 GB) memory option kits or 48 GB of memory is supported with 120W processors.

Storage
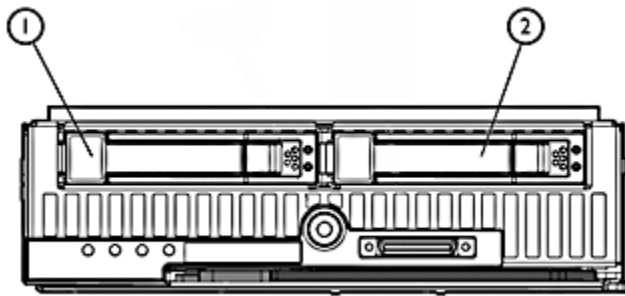
1-2   2 x SFF SAS or SATA Hot Plug Hard Drives

Hard Drives

SAS Enterprise (ENT) Drives 2.5" Drives, Hot Plug

	Quantity Supported	Position Supported	Controller
300GB 3G 10K SAS	2	1-2	HP Smart Array E200i Controller
146GB 3G 10K SAS			
72GB 3G 15K SAS			
72GB 3G 10K SAS			
36GB 3G 15K SAS			

SATA SFF Hot Plug Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K	2	1-2	HP Smart Array E200i Controller
120GB 1.5 G SATA 5.4K	NOTE: This option is not supported or available within the Drive-less CTO Model.		

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
XP Disk Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs

HP StorageWorks XP10000 Disk Array:
http://h18006.www1.hp.com/products/storageworks/xp10000/index.html (Worldwide)

	Quantity Supported	Position Supported	Host Controller or Adapter
Enterprise Virtual Array Systems	Please see the XP Disk Array Systems QuickSpecs below to determine configuration requirements	External	Please see the XP Disk Array Systems Quick Specs for the latest list of supported HBAs

HP StorageWorks Enterprise Virtual Array Family:
http://h18006.www1.hp.com/products/quickspecs/12408_div/12408_div.html (Worldwide)

QuickSpecs

HP ProLiant BL460c Server Blade

Technical Specifications

System Unit	Dimensions (H x W x D) (with bezel)		7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm)
	Weight (approximate)	Maximum (all hard drives and processors installed)	14.20 lb (6.44 kg)
		Minimum (one hard drive and processor installed)	10.75 lb (4.87 kg)
	Power Specifications		For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/ 12790_div.html HP BladeSystem c7000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12810_div/ 12810_div.html To review typical system power ratings use the HP BladeSystem Power Sizer which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise		For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: HP BladeSystem c3000 Enclosure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12790_div/

Technical Specifications

HP Smart Array E200i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI)
		1.5G SATA (Serial Advanced Technology Attachment)
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x2 3G SAS provides 600MB/s maximum bandwidth.
	Cache Memory	40-bit 64 MB or 128 MB cache: ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	144GB (2 x 72GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 5 (Distributed Data Guarding) requires 128MB BBWC option
		RAID1, 1+0 (Striping & Mirroring)
		RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware

Embedded NC373i Multifunction Gigabit Server Adapter	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	2000 Mb/s full duplex (theoretical maximum value)
		NOTE: The Gigabit Ethernet adapters above transmit from the server at 2000 Mbps, full duplex per port only. For more information, see the "Network Controller" segment in the Standards Features section.
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	- TCP/IP offload engine (TOE) for Microsoft Windows 2003 - iSCSI Boot for Linux - Optional accelerated iSCSI 9K jumbo frames - TCP/IP checksum offload (TCO) - Large send offload (LSO) - Interrupt coalescence - Dual address cycles (DAC) - Wake-on-LAN (WOL) - Pre-boot execution environment (PXE) - ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing - IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Microsoft Windows

Technical Specifications

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.